REMARKS

Upon entry of the present amendment, claims 7, 8, 18, 20-29, 33, 38, and 39 will be pending. Claims 1-6, 9-17, 19, 30-32, and 34-37 have been canceled without prejudice. Claims 20–29 have been withdrawn. Claims 7, 8, 20 and 26 have been amended to correct punctuations and claim dependencies. Applicants have added new claims 38 and 39, which are supported throughout the specification, for example, at page 21, lines 29-30; and at page 23, lines 5-6.

Withdrawn Rejections

Applicants note with appreciation that the Office has withdrawn the previous rejections under 35 U.S.C. § 103.

35 U.S.C. § 103

The Office rejected claims 1, 3, 7-8, 17-18, and 33 as allegedly obvious over Plotkin et al. (EP 0389286 B1, "Plotkin") in view of Endresz et al. (Vaccine, 19: 3972-3980, 2001; "Endresz") and Mach et al. (Journal of Virology, 11881-11892, 2000; "Mach").

As an initial matter, applicants note that the Office Action states (at page 3) that the claims are rejected under 35 U.S.C. § 102(b). However, the Office Action asserts (at page 6):

> ... in view of the teachings of Plotkin, it would have been obvious for one of ordinary skill in the art, at the time the claimed invention was made, to replace the HCMV gB subunit of gcll adenovirus of Plotkin with plasmid gM (UL100) and gN (UL73) of Mach for priming with said plasmids and boost with their recombinant proteins as taught by Endresz for a vaccine in humans for inducing neutralizing antibodies against HCMV with a reasonable expectation of success.

Thus, applicants assume that the Office meant to reject the claims under 35 U.S.C. § 103, not 35 U.S.C. § 102(b). Given this assumption, applicants traverse the obviousness rejection based on the following comments and the attached declaration of an expert in the field of CMV research, Edward S. Mocarski, Jr., Ph.D. ("the Mocarski Declaration," a copy of which is attached as "Exhibit A"), in which Dr. Mocarski explains that the gB glycoprotein is very different from the gcII (gM/gN) complex, and that experimental results and suggestions relating to gB cannot be extrapolated to hold true for the gcII complex.

The present claims are directed to, *inter alia*, a composition including a plurality of nucleic acid molecules (e.g., plasmids) comprising nucleotide sequences encoding different human cytomegalovirus (HCMV) polypeptides that induce a neutralizing antibody response. The HCMV polypeptides comprise glycoprotein M (gM), or an antigenic fragment of gM, and glycoprotein N (gN), or an antigenic fragment of gN.

Plotkin discloses administering a recombinant adenovirus having a gene encoding the HCMV glycoprotein B (gB) to hamsters, which produced neutralizing antibody to HCMV (see, e.g., Example 3). Although Plotkin suggests in passing (see, e.g., column 8, lines 3-7) that its recombinant adenovirus expression system could be used to express other HCMV subunit proteins, e.g., gcII, the reference does not contain any actual examples of an adenovirus that expresses gcII (i.e., the gM/gN complex), or any example of such an adenovirus being administered to any subject. In fact, when Plotkin filed his priority application in 1989 little was known about exactly what glycoproteins were part of the so-called gcII complex.

Endresz describes administering a plasmid encoding gB to mice. There is nothing in this reference about gN and gM.

Mach suggests (see, e.g., Abstract) that gM and gN form a complex, and that the gM/gN complex may be an antigenic target of antiviral antibody responses. However, while Mach discloses that the gM-gN protein complex "may represent a major antigenic target of antiviral antibody responses," Mach fails to suggest that gM and gN could be used as a nucleic acid-based vaccine as presently claimed. In addition, Mach ends his paper by stating that "[f]uture experiments will be directed towards defining the functional and immunological properties of the gM-gN complex" (page 11891, left col.). Moreover, the gM- and gN-expressing plasmids disclosed in Mach were used solely to express these polypeptides *in vitro*.

In essence, none of these references discloses any data demonstrating or suggesting that gcII (i.e., gM and gN) could be successfully used as a nucleic acid-based vaccine to induce a neutralizing antibody response against CMV. Nevertheless, the Office Action asserts (at pages 6 and 7) that those skilled in the art would have reasonably expected that plasmids expressing gN and gM could be used as a DNA vaccine, apparently based on the gB data disclosed in Plotkin

and Endresz, and the suggestion in Mach that gcII may be an antigenic target of antiviral antibody responses.

Applicants disagree that those skilled in the art would have had any expectation that a nucleic acid-based vaccine based on gM and gN would have been successful. Applicants support this position with the Mocarski Declaration ("Exhibit A"), in which Dr. Mocarski explains why those skilled in the art would not have expected a gM/gN nucleic acid-based vaccine to work, and why data pertaining to gB cannot be extrapolated to gM and gN. As the Declaration elucidates (see paragraph 3), gB is a very different protein, both structurally and functionally, from gcII. In particular, unlike gB, gcII is extremely hydrophobic. This hydrophobicity renders gcII difficult to express and an unsuitable candidate for a subunit vaccine. Thus, as Dr. Mocarski stated in his Declaration (at paragraph 4):

> Due to the unique properties of gcII, it would not have been obvious that any DNA or other vaccine based on expression of gcII within cells would have worked before the filing of the present application. Further, one could not have reasonably concluded that, because CMV vaccines based on other glycoproteins such as gB had been generated or described in the literature, a DNA vaccine based on gcII would also have worked to induce a neutralizing antibody response in a subject.

Moreover, as set forth in the Declaration (see paragraph 5), prior to the present invention, there had been no reported successful attempt to generate any kind of a CMV vaccine based on gcII. Certainly, the Office has not cited a single reference that describes an actual vaccine based on gcII. The present specification, on the other hand, discloses actual data (see, e.g., Example 2) showing that administering a combination of gM- and gN-expressing nucleic acid molecules to rabbits can produce a synergistic neutralizing antibody response *in vivo*. This result was unexpected, at least in part, because of the reasons stated in the Declaration.

In view of the foregoing, applicants submit that, based on the teachings of Plotkin, Endresz and Mach, individually or in combination, it would not have been obvious to arrive at applicants' DNA vaccine based on gM and gN. Reconsideration and withdrawal of this rejection are respectfully requested.

CONCLUSION

Applicants respectfully request that all claims be allowed. Applicants do not concede any positions of the Examiner that are not expressed above, nor do applicants concede that there are not other good reasons for patentability of the presented claims or other claims.

The extension fee in the amount of $555 is being paid concurrently herewith on the Electronic Filing System (EFS) by way of Deposit Account authorization. Please apply any other charges or credits to deposit account 06-1050, referencing Attorney Docket No. 07917-0190001.

Respectfully submitted,

Date: March 2, 2009

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Exhibit A

Attorney's Docket No.: 07917-0190001 / UMMS 03-30

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	: Lu et al.	Art Unit	: 1632
Serial No.	: 10/789,247	Examiner	: Magdalene K. Sgagias
Filed	: February 27, 2004	Conf. No.	: 9906
Title	: COMPOSITIONS AND METHODS FOR CYTOMEGALOVIRUS TREATMENT		

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

DECLARATION OF EDWARD S. MOCARSKI, JR., PH.D.
UNDER 37 C.F.R. § 1.132

I, Edward S. Mocarski, Jr., declare the following:

1. Because of my own work, I am familiar with cytomegalovirus (CMV) antigens, the various known CMV glycoproteins, including glycoprotein complex I (gcI), which includes glycoprotein B (gB) and glycoprotein complex II (gcII), which includes glycoproteins M and N, and related vaccines. My *curriculum vitae* is attached as Appendix A.

2. I have reviewed the patent application captioned above ("the present application").

3. It is well known to those skilled in the CMV field that gB is a very different protein from gcII. First, while gB is a monomeric protein, gcII refers to a dimeric complex comprising the CMV glycoprotein M (gM) and CMV glycoprotein N (gN). gM is composed of multiple membrane-spanning domains and associates with gN. gM and gN assemble in a distinct location from gB in the cytoplasm of CMV-infected cells as a component of the envelope of mature virions. The gcII complex has a distinct structure, and plays an essential function in viral infection that is completely unique from that of gB.

Second, gcII is extremely hydrophobic. Thus, unlike gB, which has a single hydrophobic membrane-spanning domain and a hydrophilic ectodomain, gcII is tightly associated within membranes. gcII cannot be readily expressed as a secreted or purified protein because of this extensive hydrophobic character. Because of these significant differences between gB and gcII, data pertaining to gB (e.g., expression of gB using an expression system; or ability of gB to induce a neutralizing antibody response in a subject) cannot be reasonably extrapolated to gcII.

For example, gcII would never be a candidate for a subunit vaccine, but needs to be expressed within cells and displayed on cellular membranes to be a component of a vaccine.

4. Due to the unique properties of gcII, it would not have been obvious that any DNA or other vaccine based on expression of gcII within cells would have worked before the filing of the present application. Further, one could not have reasonably concluded that, because CMV vaccines based on other glycoproteins such as gB had been generated or described in the literature, a DNA vaccine based on gcII would also have worked to induce a neutralizing antibody response in a subject.

5. To the best of my knowledge, there has been no reported successful attempt to generate any type of a CMV vaccine based on gcII prior to the work done by Dr. Shan Lu as described and claimed in the present application. Before Dr. Lu's work, it would not have been scientifically or practically obvious to generate a DNA vaccine based on gcII, or to have reasoned that such a vaccine would have worked.

6. I have reviewed an Office Action from the United States Patent and Trademark Office (USPTO) dated August 29, 2008 (the "Office Action") and the references cited therein (Plotkin et al., EP 0389286; Endresz et al, Vaccine, 19: 3972-3980, 2001; Mach et al., Journal of Virology, 11881-11892, 2000). In particular, I note that the USPTO has alleged that Dr. Lu's invention as recited in claims 1, 3, 7, 8, 17, 18 and 33 would have been obvious to those skilled in this field in view of Plotkin et al., Endresz et al. and Mach et al. For example, the USPTO states (at page 6 of the Office Action):

> Accordingly, in view of the teachings of Plotkin, it would have been obvious for one of ordinary skill in the art, at the time the claimed invention was made, to replace the HCMV gB subunit of gcll adenovirus of Plotkin with plasmid gM (UL100) and gN (UL73) of Mach for priming with said plasmids and boost with their recombinant proteins as taught by Endresz for a vaccine in humans for inducing neutralizing antibodies against HCMV with a reasonable expectation of success.

For at least the reasons set forth above, I disagree with the Office's assertion that the claims of the present application would have been obvious at the time of Dr. Lu's invention in view of these cited references.

6. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patents issued thereon.

Respectfully submitted,

Date: March 2, 2009

Edward S. Mocarski, Jr.

Appendix A

CURRICULUM VITAE

Last modified: February 1, 2009
Date Printed: February 11, 2009

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MedImmune
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Mountainview, CA 94025

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Robert W. Woodruff Professor
Georgia Cancer Coalition Scholar
Department of Microbiology and Immunology
Emory Vaccine Center
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Professor Emeritus, Stanford University School of Medicine.
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Date of Birth:	April 29, 1952
Place of Birth:	Belleville, New Jersey
Marital Status:	Married to Christine L. Martens, Ph.D.
	Daughter: Emily C. Mocarski (b. 1986)
Home Address:	1635 Mason Mill Rd. NE
	Atlanta GA 30329
	home (404) 929-6592 cell (650) 714-7005

Education and Employment Record (current appointments in bold):

Rutgers University, New Brunswick, New Jersey	A.B. Microbiology	1970-74
University of Iowa, Iowa City, Iowa	Ph.D. Microbiology	1974-79
USPHS Predoctoral Trainee in Cellular and Molecular Biology		1975-78
The University of Chicago, Chicago, Illinois	Postdoctoral	1979-83
USPHS Postdoctoral Trainee in Virology		1979-81
(University of Bologna Visiting Scientist, 1980)		
Leukemia Society of America Special Fellow		1981-83
Stanford University School of Medicine, Stanford, California		
Assistant Professor of Microbiology & Immunology		1983-89
Associate Professor of Microbiology & Immunology		1989-95
Chairman of the Department of Microbiology & Immunology		1995-99
Professor of Microbiology & Immunology		1995-06
Professor Emeritus		2006
Stanford University, Stanford, California		
Associate Dean of Research		2000-01
Emory University, Atlanta Georgia		
Robert W. Woodruff Professor of Microbiology & Immunology		2006-(on leave)
Emory Vaccine Center		2006-(on leave)
MedImmune, a wholly owned subsidiary of AstraZeneca		
Distinguished Fellow (senior management)		2008-present

Sabbatical leave:	SyStemix, Palo Alto, California	1990 (6 mo.)
	Aviron, Mountain View, California	1995 (6 mo.)

National/Foreign Review Panel Memberships (current membership in bold):

Institute of Medicine (National Academy of Sciences) Consultant, Committee on Review of Priorities in th National Vaccine Plan, 2008
NIH Reviewers Reserve/ad hoc reviews (1994-2008)
Topics in Virology Study Section (*ad hoc* 2007-2008)
UK MRC Virology Focus Strategy Review Group (2006-2008)
NIDOCD Review Panel on CMV-related Hearing Loss (2004)
NIH Virology B Study Section (2004)
Advisory Panel to Office of AIDS Res on Opportunistic Infections (1995-96)
NIH-NIAID Spec Review: Molec. & Struc. Appr. Antiviral Drug Design (1994)
NIH Experimental Virology Study Section (1990-1994)
NIH-NIAID Special Review - Animal Models of Human Viral Infections (1990)
NIH-NIAID Workshop on Opportunistic Infections in AIDS (1989)
NIH Small Business Administration Study Section (1988)
USDA Biotechnology Study Section (1986-88)

Ad Hoc Panel Member: United Kingdom MRC reviewer (1999, 2003-2008), NIH Clinical Sciences I Study Section (1985), NIH Site Visit Panels (1986, 1987), NIH Virology Study Section (1988), NIH-NIAID Microbiology and Infectious Disease Research Committee (1989), USDA-Hatch Grant Program Reviewer - University of Nevada (1989), NIH-NIAID Board of Scientific Counselors (1989), USDA Biotechnology Study Section (1989-95).

Reviewer: the USDA Biotechnology Study Section (1989-95) and the NIH-NIAID Board of Scientific Counselors (1989). I have also served as a reviewer or panel member for the Medical Research Council (United Kingdom), the Wellcome Foundation, the Australian Medical Research Council, the Canadian National Institute of Health, the Israel Science Foundation, the Veterans Administration, the National Foundation March of Dimes, the National Science Foundation and the Natural Sciences and Engineering Research Council of Canada.

Editorial Board (current membership in bold):
***Journal of Virology* (1991-2011), *Virology* (1991-2009)**, *J. Biol. Chem* (2001-2004 & 1994-1999), *Intervirology* (1986-1989)

Invited Reviewer:
Journals: *Science, Immunity, Cell, Journal of General Virology, Virus Research, Intervirology, Archives of Virology, Journal of Viral Immunology, Proceedings of the National Academy of Sciences, Journal of Clinical Microbiology, Journal of Infectious Diseases, New England Journal of Medicine, Journal of Experimental Medicine, Blood, Journal of Immunology, Journal of Interferon and Cytokine Research, Journal of Biological Chemistry*

Other Honors and Awards:

Maurice Hilleman Lecturer, The University of Chicago (2008)
Georgia Cancer Coalition Eminent Scholar (2006-2011)
Robert W. Woodruff Chair Professorship (2006-present)
Stanford University Fellow (2002-2004)
Pfizer Visiting Professor in Infectious Diseases, Univ of Oklahoma (2001)

Elkin's Lecture, Emory University (1999)
ASM Foundation for Microbiology Lecturer (1992-94)
National Institutes of Health Wallace Rowe Lecture (1993)
American Cancer Society Faculty Research Grant (1984-1993)
Leukemia Society of America Special Fellow (1981-1983)
Agnes Axtell Moule Faculty Scholar (1983)
Andrew Mellon Fellow (1984)

Professional Affiliations:

American Society for Microbiology
American Society for Virology
American Association of Immunologists

Consultant/Advisory Board Member:

Current Academic Programs:

Louisiana Biomedical Research Network (INBRE), P.I., Klei, Louisiana State University (2004 - present)
Nebraska Center for Virology (COBRE), P.I., Wood, University of Nebraska (2000 - present)

Current Companies:

Scientific Advisory Board, ChemoCentryx (1997-2009)

Past or occasional consulting and scientific advisory board member:

GlobeImmune (2003-2008), Co-crystal Design (2007-2009)Berlex (2005), Genzyme/ILEX (2004-2005), 9th District Court, Judicial Scientific Advisor (2000-2003); ImmunoGen, Inc. (1995-2002); GeneTrol (2001-2002); MedImmune, Inc. (1992-2002) (called Aviron from 1992-2002); Ribozyme Pharmaceuticals, Inc. (1992-2001); Parke-Davis (Warner-Lambert) (1998-1999); Glaxo-Wellcome Herpesvirus Consultancy Group (1996-1998); Searle-Monsanto, Skokie, Illinois (1994-1995); Chiron Corporation, Emeryville, California (1991-92); Schering-Plough, Inc., Madison, New Jersey (1984-1994); Syntro, Inc., San Diego, California (1985-88); SyStemix, Palo Alto, California (1990)

PUBLICATIONS

Journals:

1. Mocarski, E.S. and M.F. Stinski (1979). Persistent infection of human fibroblast cells by human cytomegalovirus. J. Virol. 31:761-775.

2. Stinski, M.F., E.S. Mocarski, D.R. Thomsen and M. Urbanowski (1979). Membrane glycoproteins and antigens induced by cytomegalovirus. J. Gen. Virol. 43:119-129.

3. Stinski, M.F., E.S. Mocarski and D.R. Thomsen (1979). Some properties of cytomegalovirus DNA from standard and defective virions. J. Virol. 31:231-239.

4. Post, L.E., A.J. Conley, E.S. Mocarski and B. Roizman (1980). Cloning of reiterated and nonreiterated herpes simplex 1 sequences as BamHI fragments. Proc. Natl. Acad. Sci. USA 77:4201-4205.

5. Mocarski, E.S., L.E. Post and B. Roizman (1980). Molecular engineering of herpes simplex virus genome: Insertion of a second L-S junction into the genome causes additional genome inversions. Cell 22:243-255.

6. Mocarski, E.S. and B. Roizman (1981). The site specific inversion sequence of the herpes simplex virus genome: Domain and structural features. Proc. Natl. Acad. Sci. USA 78:7047-7051.

7. Mocarski, E.S. and B. Roizman (1982). Herpesvirus dependent amplification and inversion of cell-associated viral thymidine kinase gene flanked by viral *a* sequences and linked to an origin of viral DNA replication. Proc. Natl. Acad. Sci. USA 79:5626- 5630.

8. Mocarski, E.S. and B. Roizman (1982). The structure and function of the herpes simplex virus DNA termini: Implications regarding circularization, inversion and generation of virion DNA. Cell 31:89-97.

9. Spaete, R.R. and E.S. Mocarski (1984). Trans-acting functions encoded by herpes simplex virus-1 recognize cis cleavage/packaging signals present on cytomegalovirus DNA. In F. Rapp (ed.) Herpesvirus, UCLA Symposium (new series) vol 21, Liss, Inc., New York.

10. Drew, W.L., E. Sweet, R. Minor, and E.S. Mocarski (1984). Multiple infections by cytomegalovirus in patients with acquired immunodeficiency syndrome: Documentation by Southern blot hybridization. J. Infect. Diseases 150:952-953.

11. Mocarski, E.S., L. Deiss, and N. Frenkel (1985). Nucleotide sequence and structural features of a novel U_{S}-*a* junction present in a defective herpes simplex virus genome. J. Virol. 55:140-146.

12. Mocarski, E.S., L. Pereira, and N. Michael (1985). Precise localization of genes on large animal virus genomes: Use of λgtII and monoclonal antibodies to map a gene for a cytomegalovirus protein family. Proc. Natl. Acad. Sci. USA 82:1266-1270.

13. Spaete, R.R. and E. S. Mocarski (1985). The *a* sequence of the cytomegalovirus genome functions as a cleavage/packaging signal for herpes simplex virus defective genomes. J. Virol. 54:817-824.

14. Spaete, R.R., and E.S. Mocarski (1985). Regulation of cytomegalovirus gene expression: α and β promoters are trans-activated by viral functions in permissive human fibroblasts. J. Virol. 56:135-143.

15. Geballe, A.P., F. L. Leach, and E.S. Mocarski (1986). Regulation of cytomegalovirus late gene expression: γ genes are controlled by posttranscriptional events. J. Virol. 57:864-874.

16. Fiala, M.D., L. A. Cone, C-M. Chang, and E.S. Mocarski (1986). Cytomegalovirus viremia increases with progressive immune deficiency in patients infected with HTLV-III. AIDS Research 2:175-181.

17. Geballe, A.P., R.R. Spaete, and E.S. Mocarski (1986). A cis-acting element within the 5' leader of a cytomegalovirus β transcript determines kinetic class. Cell 46:865-872.

18. Elias, P., M.E. O'Donnell, E.S. Mocarski and I.R. Lehman (1986). A DNA binding protein specific for an origin of replication of herpes simplex virus type 1. Proc. Natl. Acad. Sci. USA 83:6322-6326.

19. Mocarski, E.S., A.C. Liu, and R.R. Spaete (1987). Structure and variability of the α sequence in the genome of human cytomegalovirus (Towne strain). J. Gen. Virol. 68:2223-2230.

20. Spaete R.R. and E.S. Mocarski (1987). Insertion and deletion mutagenesis of the human cytomegalovirus genome. Proc. Natl. Acad Sci. USA 84:7213-7217.

21. Kemble, G.W., A.L. McCormick, L. Pereira and E.S. Mocarski (1987). A cytomegalovirus protein with properties of herpes simplex virus ICP8: Partial purification of the polypeptide and map position of the gene. J. Virol. 61:3143-3151.

22 Mocarski, E.S., W.C. Manning and J.M. Cherrington (1988). Recombinant cytomegalovirus-based expression vectors. In: Y. Gluzman and S.H. Hughes (eds.) Viral Vectors Cold Spring Harbor Press. pp. 78-84.

23. Ho, D. and E.S. Mocarski (1988). β-galactosidase as a marker in peripheral and neural tissues of the herpes simplex virus infected mouse. Virology 167:279-283.

24. Geballe, A.P. and E.S. Mocarski (1988). Translational control of cytomegalovirus gene expression is mediated by upstream AUG codons. J. Virol. 62:3334-3340.

25. Manning, W.C. and E.S. Mocarski (1988). Insertional mutagenesis of the murine cytomegalovirus genome: One prominent α gene (ie2) is dispensable for growth. Virology 167:477-484.

26. Nasseri, M.F. and E.S. Mocarski (1988). The cleavage recognition signal is contained within sequences surrounding an *a-a* junction in herpes simplex virus DNA. Virology 167:25-30.

27. Crute, J.J., E.S. Mocarski and I.R. Lehman (1988). A DNA helicase induced by herpes simplex virus type 1. Nucl. Acids Res. 16:6585-6596.

28. Mocarski, E.S., L. Pereira and A.L. McCormick (1988). Human cytomegalovirus ICP22, the product of the HWLF1 reading frame, is an early nuclear protein that is released from cells. J. Gen. Virol. 69:2613-2621.

29. Cherrington, J.M. and E.S. Mocarski (1989). Human cytomegalovirus ie1 transactivates the α promoter-enhancer via an 18-base-pair repeat element. J. Virol. 63:1435-1440.

30. Karlin, S., B.E. Blaisdell, E.S. Mocarski and V. Brendel (1989). A method to identify distinctive charge configurations in protein sequences, with application to human herpesvirus polypeptides. J. Mol. Biol. 205:164-178.

31. Crute, J.J., T. Tsurimi, S.K. Weller, M.D. Challberg, E.S. Mocarski and I.R. Lehman (1989). The herpes simplex virus helicase-primase consists of three proteins encoded by the UL5, UL8 and UL52 genes. Proc. Natl. Acad. Sci. USA 86: 2186-2189.

32. Ripalti, A., M.P. Landini, E.S. Mocarski and M. La Placa (1989). Identification and preliminary use of recombinant λgtII fusion proteins in cytomegalovirus diagnosis. J. Gen. Virol. 70:1247-1251.

33. Leach, F.S. and E.S. Mocarski (1989). Regulation of cytomegalovirus late gene expression: Differential use of three start sites in the transcriptional activation of ICP36 gene expression. J. Virol 63:1783-1791.

34. Kemble, G.W. and E.S. Mocarski (1989). A host cell protein binds to a highly conserved sequence element (pac-2) within the cytomegalovirus *a* sequence. J. Virol. 63:4715-4728.

35. Ho, D. and E.S. Mocarski (1989). Herpes simplex virus latent RNA (LAT) is not required for latent infection in the mouse. Proc. Natl. Acad. Sci. USA 86:7596-7600.

36. Sambucetti, L.C., J.M. Cherrington, G.W.G. Wilkinson and E.S. Mocarski (1989). NF-κB activation of the cytomegalovirus enhancer is mediated by a viral transactivator and by T cell stimulation. EMBO J. 8:4251-4258.

37. Casareale, D., M. Fiala, C.M. Chang, L.A. Cone and E.S. Mocarski (1989). Cytomegalovirus enhances lysis of HIV-infected T lymphoblasts. Int. J. Cancer 44:124-130.

38. Cherrington, J.M., E. Khoury and E.S. Mocarski (1991). Human cytomegalovirus *ie2* negatively regulates α gene expression via a short target sequence near the transcription start site. J. Virol. 65:887-896.

39. Schachtel, G.A., P. Bucher, E.S. Mocarski, B.E. Blaisdell and S. Karlin (1991). Evidence for selective evolution in codon usage in conserved amino acid segments of human alphaherpesvirus proteins. J. Mol. Evol. 33:483-494.

40. Stasiak, P.C. and E.S. Mocarski (1991). Transactivation of a cytomegalovirus γ gene promoter requires TRS1, a member of the US22 family. In M. P. Landini (ed.) Progress in Cytomegalovirus Research, Elsevier Science Publishers, Amsterdam. 63-79.

41. Ripalti, A. and E.S. Mocarski (1991). The products of human cytomegalovirus genes UL1-UL7, including gp48, are dispensable for growth in cell culture. In M. P. Landini (ed.) Progress in Cytomegalovirus Research, Elsevier Science Publishers, Amsterdam. 57-60.

42. Stasiak, P.C. and E.S. Mocarski (1992). Transactivation of the cytomegalovirus ICP36 gene promoter requires the α gene product TRS1 in addition to IE1 and IE2. J. Virol. 66:1050-1058.

43. Maciejewski, J., E. Bruening, E. Mocarski, N. Young and S. C. St Jeor (1992). Infection of hematopoietic progenitor cells by human cytomegalovirus. Blood 187:170-178.

44. Dormitzer, P.R., D.Y. Ho, E.R. Mackow, E.S. Mocarski and H. B. Greenberg (1992). Neutralizing epitopes on herpes simplex virus-1-expressed rotavirus VP7 are dependent on coexpression of other rotavirus proteins. Virology 187:18-32.

45. Dutch, R. E., R. C. Bruckner, E. S. Mocarski and I. R. Lehman (1992). Herpes simplex virus type 1 recombination: Role of DNA replication and *a* sequences. J. Virol. 66:277-285.

46. Masse, M.J., S. Karlin, G.A. Schachtel and E.S. Mocarski (1992). Human cytomegalovirus origin of DNA replication (oriLyt) resides within a highly complex repetitive region. Proc. Natl. Acad. Sci. USA 89:5246-5250.

47. Manning, W.C., C.A. Stoddart, L.A. Lagenaur, G.B. Abenes and E.S. Mocarski (1992). Cytomegalovirus determinant of replication in salivary glands. J. Virol. 66:3794-3802.

48. Bruckner, R.C., R.E. Dutch, B. Zemelman, E. S. Mocarski and I. R. Lehman (1992) Recombination between herpes simplex virus type 1 *a* sequences. Proc. Natl. Acad. Sci. USA 89:10950-10954.

49. Mocarski, E.S., M. Bonyhadi, S. Salimi, J.M. McCune and H. Kaneshima (1993) Human cytomegalovirus in the SCID-hu mouse: Thymic epithelial cells are prominent targets of viral infection. Proc. Natl. Acad. Sci. USA 90:104-108.

50. Ho, D.Y., E.S. Mocarski and R. Sapolsky (1993). Altering central nervous system physiology with a defective herpesvirus vector expressing the glucose transporter gene. Proc. Natl. Acad. Sci. USA 90:3655-3659.

51. Cardin, R.D., J.M. Boname, G.B. Abenes, S.A. Jennings and E.S. Mocarski (1993). Reactivation of murine cytomegalovirus from latency. In S. Michelson and S. A. Plotkin (ed.) Multidisciplinary Approaches to Understanding Cytomegalovirus Disease, Elsevier, Amsterdam. pp. 65-74.

52. Boname, J.M., L.A. Lagenaur and E.S. Mocarski (1994). Murine cytomegalovirus genes influencing virus growth and tropism for salivary gland. In Y. Becker and G. Darai (ed.) Frontiers of Virology, Vol. 3, Springer-Verlag, Heidelberg. pp. 315-328

53. Karlin, S., E.S. Mocarski and G.A. Schachtel (1994). Molecular evolution of herpesviruses: Genomic and protein sequence comparisons. J. Virol. 68:1886-1902.

54. Vieira, J., H.E. Farrell, W.D. Rawlinson, and E.S. Mocarski (1994). Genes in the *Hin*dIII J fragment of the murine cytomegalovirus genome are dispensable for growth in cultured cells: Insertion mutagenesis with an *lacZ/gpt* cassette. J. Virol. 68:4837-4846.

55. Stoddart, C.A., R.D. Cardin, J.M. Boname, W.C. Manning, G.B. Abenes and E.S. Mocarski (1994). Peripheral blood mononuclear phagocytes mediate dissemination of murine cytomegalovirus. J. Virol. 68:6243-6253.

56. Kondo, K., H. Kaneshima, and E.S. Mocarski (1994). Human cytomegalovirus latent infection of granulocyte-macrophage progenitors. Proc. Natl. Acad. Sci. USA 91:11879-11883.

57. Jenkins, D.E., C.L. Martens and E.S. Mocarski (1994). Human cytomegalovirus late protein encoded by ie2: a trans-activator as well as a repressor of gene expression. J. Gen. Virol 75:2337-2348.

58. Lagenaur, L.A., W.C. Manning, J. Vieira, C.L. Martens and E.S. Mocarski (1994). The structure and function of the murine cytomegalovirus *sgg*1 gene: A determinant of viral growth in salivary gland acinar cells. J. Virol. 68:7717-7727.

59. Brown, J.M., H. Kaneshima and E.S. Mocarski. (1995) Dramatic interstrain differences in the replication of human cytomegalovirus in SCID-hu mice. J. Infect. Dis. 171:1599-1603.

60. Cardin, R.D., G.B. Abenes, C.A. Stoddart and E.S. Mocarski. (1995) Murine cytomegalovirus IE2, an activator of gene expression, is dispensable for growth and latency in mice. Virology 209:236-241.

61. Greaves, R.F., J.M. Brown, J. Vieira and E.S. Mocarski. (1995) Selectable insertion and deletion mutagenesis of the human cytomegalovirus genome using the *E. coli* guanosine phosphoribosyl transferase (*gpt*) gene. J. Gen. Virol. 76:2151-2160

62. Kondo, K., and E.S. Mocarski (1995) Cytomegalovirus latency and latency-specific transcription in hematopoietic progenitors. Scand. J. Infect. Dis. (Suppl) 99:63-67.

63. Cha, T-A., E. Tom, G.W. Kemble, G.M. Duke, E.S. Mocarski and R.R. Spaete (1996) Human cytomegalovirus clinical isolates carry at least 19 genes not found in laboratory strains. J. Virol. 70:78-83.

64. Prichard, M.N., G.M. Duke and E.S. Mocarski (1996) Human cytomegalovirus uracil DNA glycosidase is required for the normal temporal regulation of both DNA synthesis and viral replication. J. Virol. 70:3018-3025.

65. Kondo, K., J. Xu and E.S. Mocarski (1996) Human cytomegalovirus latency-specific gene expression in granulocyte-macrophage progenitors in culture and in healthy seropositive individuals. Proc. Natl. Acad. Sci. USA 93:11137-11142.

66. Mocarski, E.S., G.W. Kemble, J.M. Lyle and R.M. Greaves (1996) A deletion mutant in the human cytomegalovirus gene encoding $IE1_{491aa}$ is replication defective due to a failure in autoregulation. Proc. Natl. Acad. Sci. USA 93:11321-11326.

67. Dittmer, D. and E.S. Mocarski (1997) Human cytomegalovirus infection inhibits G_1/S transition. J. Virol. 71:1629-1634.

68. Lowry, P.W., C.S. Koropchak, C.Y.H. Choi, E.S. Mocarski, E.R. Kern, P.R. Kinchington and A.M. Arvin (1997) The synthesis and immunogenicity of varicella-zoster virus glycoprotein E and immediate-early protein (IE62) expressed in recombinant herpes simplex virus-1. Antiviral Res. 33:187-200.

69. Masse, M.J., M. Messerle and E.S. Mocarski (1997) The location and sequence composition of the murine cytomegalovirus replicator (*ori*Lyt). Virology 230:350-360.

70. Mocarski, E.S., M.N. Prichard, C.S. Tan and J.M. Brown (1997) Reassessing the organization of the UL42-UL43 region of the human cytomegalovirus strain AD169 genome. Virology 239:169-175.

71. Penfold, M.E.T, and E.S. Mocarski (1997) Formation of cytomegalovirus DNA replication compartments defined by localization of viral proteins and DNA synthesis. Virology 239:46-61.

72. Greaves, R. F., and E.S. Mocarski (1998) Low multiplicity growth defect and gene expression during infection by a human cytomegalovirus *ie*1 mutant. J. Virol. 72:366-379.

73. McVoy, M.A., D.E. Nixon, S.P. Adler, and E.S. Mocarski (1998) Sequences within the herpesvirus-conserved *pac*1 and *pac*2 motifs are required for cleavage and packaging of the murine cytomegalovirus genome. J. Virol. 72:48-56.

74. Hahn, G., R. Jores and E.S. Mocarski (1998) Cytomegalovirus latency in a common precursor of dendritic and myeloid cells. Proc. Natl. Acad. Sci. USA 95:3937-3942.

75. Leong, C.C., T.L. Chapman, P.J. Bjorkman, D. Formankova, E.S. Mocarski, J.H. Phillips and L.L. Lanier (1998) Modulation of natural killer cell cytotoxicity in human cytomegalovirus infection: The role of endogenous class I MHC and a viral class I homolog. J. Exp. Med. 187:1681-1687.

76. Reichenspurner, H., V. Soni, M. Nitschke, G.J. Berry, T. Brazelton, R. Shorthouse, X. Huang, J. Boname, R. Girgis, B.A. Raitz, E. Mocarski, Sandford, G. and R.E. Morris (1998) Enhancement of obliterative airway disease in rat tracheal allografts infected with recombinant rat cytomegalovirus. J. Heart Lung Transplant. 17:439-451.

77. Bolovan-Fritts, C.A., E.S. Mocarski and J.A. Wiedeman (1999) Peripheral blood CD14+ cells from healthy subjects carry a circular conformation of latent cytomegalovirus genome. Blood 93:394-398.

78. Slobedman, B., and E.S. Mocarski (1999) Quantitative analysis of latent human cytomegalovirus. J. Virol. 73:4806-4812.

79. Penfold, M.E.T., D.J. Dairaghi, G. M. Duke, N. Saederup, E.S. Mocarski, G.W. Kemble and T.J. Schall (1999) Cytomegalovirus encodes a potent α chemokine. Proc. Natl. Acad. Sci. USA 96:9839-9844.

80. McVoy, M.A., and E.S. Mocarski (1999) Tetracycline-mediated regulation of gene expression within the human cytomegalovirus genome. Virology 258: 295-303.

81. Saederup, N., Y.C. Lin, D.J. Dairaghi, T.J. Schall and E.S. Mocarski (1999) Cytomegalovirus-encoded beta chemokine promotes monocyte-associated viremia in the host. Proc. Natl. Acad. Sci. USA 96: 10881-10886.

82. Goldmacher, V.S., L.M. Bartle, A. Skaletskaya, C.A. Dionne, N.L. Kedersha, C.A. Vater, J.W. Han, R.J. Lutz, S. Watanabe, E.D. McFarland, E.D. Kieff, E.S. Mocarski and T. Chittenden. (1999) A cytomegalovirus mitochondria-localized inhibitor of apoptosis structurally unrelated to Bcl-2. Proc. Natl. Acad. Sci. USA 96: 12536-12541.

83. van den Pol, A.N., E.S. Mocarski, N. Saederup, J. Vieira and T.J. Meier. (1999) Cytomegalovirus cell tropism, replication and gene transfer in brain. J. Neuroscience 19:10948-10965.

84. Landini, M.P., T. Lazzarotto, J. Xu, A. Geballe and E.S. Mocarski. (2000) Humoral response to proteins of human cytomegalovirus latent transcripts. Biol. Blood Marrow Transplant 6:100-108.

85. White, K.L., B. Slobedman, J. Xu and E.S. Mocarski. (2000) Human cytomegalovirus latency-associated protein pORF94 is dispensable for productive and latent infection. J. Virol. 74:9333-9337.

86. Wolf, D.G., C. Tan Courcelle, M.N. Prichard and E.S. Mocarski. (2001) Distinct and separate roles for herpesvirus-conserved UL97 kinase in cytomegalovirus DNA synthesis and encapsidation. Proc. Natl. Acad. Sci. USA 98:1895-1900.

87. Courcelle, C.T., J. Courcelle, M.N. Prichard and E.S. Mocarski. (2001) Cytomegalovirus requires uracil-DNA glycosylase activity for transition to late phase viral DNA replication. J. Virol. 75:7592-7601.

88. Skaletskaya, A., L.M. Bartle, T. Chittenden, A.L. McCormick, E.S. Mocarski and V.S. Goldmacher. (2001) A cytomegalovirus-encoded inhibitor of apoptosis that suppresses caspase-8 activation. Proc. Natl. Acad. Sci. USA 98:7829-7834.

89. Roback, J.D., C.D. Hillyer, W.L. Drew, M. Laycock, J. Luka, E.S. Mocarski, B. Slobedman, J.W. Smith, C. Soderberg-Naucler, D. Todd, S. Woxenius, and M.P. Busch. (2001) Multicenter evaluation of PCR methodologies to detect cytomegalovirus DNA in blood donors. Transplantation 41:1249-1257.

90. Saederup, N., S.A. Aguirre, T.E. Sparer, D.M. Bouley and E.S. Mocarski. (2001) Murine cytomegalovirus CC chemokine homolog MCK-2 (m131-129) is a determinant of dissemination that increases inflammation at initial sites of infection. J. Virol. 75:9966-9976.

91. Arase, H., E.S. Mocarski, A.E. Campbell, A.B. Hill and L.L. Lanier (2002) Direct recognition of cytomegalovirus by activating and inhibitory NK cell receptors. Science 296:1323-1326.

92. Slobedman, B., E.S. Mocarski, A.M. Arvin, E. Mellins and A. Abendroth. (2002) Latent human cytomegalovirus downregulates major histocompatibility complex class II expression on myeloid cells. Blood 100:2867-2873.

93. Carr, W.H., A.M. Little, E.S. Mocarski, and P. Parham. (2002) NK-cell mediated lysis of autologous HCMV infected skin fibroblasts is highly variable among NK-cell clones and polyclonal NK-cell lines. Clin. Immunology 105:126-140.

94. McCormick, A.L., V.L. Smith, D. Chow, and E.S. Mocarski. (2003) Disruption of mitochondrial networks by human cytomegalovirus *UL37* gene product vMIA. J. Virol. 77:631-641.

95. Hertel, L., V.G. Lacaille, H. Strobl, E.D. Mellins, and E.S. Mocarski. (2003) Susceptibility of immature and mature Langerhans cell-type dendritic cells to infection and immunomodulation by human cytomegalovirus. J. Virol. 77:7563-7574.

96. Lodoen M., K. Ogasawara, J.A. Hamerman, H. Arase, J.P. Houchins, E.S. Mocarski, and L.L. Lanier. (2003) NKG2D-mediated NK cell protection against cytomegalovirus is impaired by viral gp40 modulation of RAE-1 molecules. J. Exp. Med. 197:1245-1253.

97. Arber, C., A. BitMansour, T.E. Sparer, J.P. Higgins, E.S. Mocarski, I.L. Weissman, J.A. Shiziru, and J.M.Y. Brown. (2003) Common lymphoid progenitors rapidly engraft and protect against lethal cytomegalovirus infection after hematopoietic cell transplantation. Blood *102*:421-428.

98. McCormick, A.L., A Skaletskaya, P.A. Barry, E.S. Mocarski, and V.S. Goldmacher. (2003) Differential function and expression of the viral inhibitor of caspase 8-induced apoptosis (vICA) and the viral mitochondrial-localized inhibitor of apoptosis (vMIA) cell death suppressors conserved in primate and rodent cytomegaloviruses. Virology 316:221-233.

99. Weis, M., T.N. Kledal, K.Y. Lin, S.N. Panchal, S.Z. Gao, H.A. Valantine, E.S. Mocarski, and J.P. Cooke. (2004) Cytomegalovirus infection impairs the nitric oxide pathway: Role of ADMA in transplant arteriosclerosis. Circulation 109:500-505.

100 Slobedman, B., J.L. Stern, A.L. Cunningham, A. Abendroth, E.S. Mocarski. (2004). Impact of human cytomegalovirus latent infection on myeloid progenitor cell gene expression. J. Virol. 78:4054-4062.

101. Sparer, T.E., J. Gosling, T.J. Schall, and E.S. Mocarski. (2004) Expression of human CXCR2 in murine neutrophils as a model for assessing cytomegalovirus chemokine vCXCL-1 function *in vivo*. J. Interferon Cyto Res 24:611-620

102. Abate, D.A., S. Watanabe, and E.S. Mocarski. (2004) Major human cytomegalovirus structural protein pp65 (ppUL83) blocks the IRF-3-dependent interferon response. J. Virol. 78: 10995-11006

103. Hertel, L., and E.S. Mocarski (2004) Global analysis of cytomegalovirus gene expression at late times during infection reveals extensive dysregulation of cell cycle gene expression and induction of pseudomitosis independent of US28 function. J. Virol. 78:11988-12011.

104. Reinhardt, J., G.B. Smith, C.T. Himmelheber, J. Clifford-Azizkhan, and E.S. Mocarski (2005) The carboxyl-terminal region of human cytomegalovirus $IE1_{491aa}$ contains an acidic domain that plays a regulatory role and a chromatin-tethering domain that is dispensable during viral replication. J. Virol. 79:225-233.

105. Brocchieri, L. T.N. Kledal, S. Karlin, and E.S. Mocarski. (2005) Predicting coding potential from genome sequence: Application to betaherpesviruses infecting rats and mice. J. Virol. 79:7570-7596.

106. McCormick, A.L., C.D. Meiering, G.B. Smith and Edward S. Mocarski. (2005) Mitochondrial cell death suppressors encoded by human and murine cytomegalovirus confer resistance to proteasome inhibitor induced apoptosis. J. Virol. 79:12205-12217

107. Noda, S., S.A. Aguirre, A. BitMansour, J.M. Brown, T.E. Sparer, J. Huang and E.S. Mocarski. (2006) Cytomegalovirus MCK-2 controls mobilization and recruitment of myeloid progenitor cells to facilitate dissemination. Blood 107:30-38.

108. Smith, G.B, and E.S. Mocarski. (2005) Contribution of GADD45 family members to cell death suppression by cellular Bcl-x_L and cytomegalovirus vMIA. J. Virol 79:14923-14932.

109. Potena, L., C. T. J. Holweg, C. Chin, H. Luikart. D. Weisshar, B. Narassimhan, W. F. Fearon, D. B. Lewis, J. P. Cooke, E. S. Mocarski, and H. A. Valantine. (2006) Acute rejection and cardiac allograft vascular disease are reduced by suppression of subclinical cytomegalovirus infection. Transplantation 82:398-405.

110. AuCoin, D. P., G. B. Smith, C. D. Meiering, and E. S. Mocarski. (2006) Betaherpesvirus-conserved cytomegalovirus tegument protein ppUL32 (pp150) controls cytoplasmic events during virion maturation. J. Virol 80:8199-8210.

111. Tu, W., L. Potena, P. Stepick-Biek, L. Liu, K.Y. Dionis, W.F. Fearon, T. Holmes, J.P. Cooke, H.A. Valantine, E.S. Mocarski, and D.B. Lewis, M.D. (2006) T-cell immunity to subclinical cytomegalovirus infection limits cardiac allograft disease. Circulation 114:1608-1615.

112. Lee, A.W., L. Hertel, R. K. Louie, T. Burster, V. Lacaille, A. Pashine, D. A. Abate, E.S. Mocarski and E.D. Mellins. (2006) Human cytomegalovirus alters localization of MHC class II and dendrite morphology in mature Langerhans cells. J. Immunol. 177:3960-3971.

113. Melnick, M., E. S. Mocarski, G. Abichaker, J. Huang, T. Jaskoll. (2006) Cytomegalovirus-induced embryopathology: Mouse submandibular salivary gland epithelial-mesenchymal ontogeny as a model. BMC Developmental Biology 6:42.

114. Hertel, L., S. Chou, and E.S. Mocarski. (2007) Role of viral and cell cycle regulated kinases in cytomegalovirus-induced pseudomitosis and replication. PLoS Pathogens 3:e6.

115. Potena, L., C.T.J. Holweg, M.L. Vana, A. L. McCormick, L. Bashyam, J. Rajamani, J.P. Cooke, H.A. Valantine and E.S. Mocarski. (2007) Frequent occult infection with cytomegalovirus despite antiviral prophylaxis in cardiac transplant recipients. J. Clin. Microbiol. 45:1804-1810

116. Fearon, W.F., L. Potena, A. Hirohata, R. Saakurai, H. Luikart, J. Lee, M.L. Vana, J.P. Cooke, E.S. Mocarski, A.C Yeung and H.A. Valantine. (2007) Changes in coronary artery dimensions early after cardiac transplantation. Transplantation 83:700-705

117. Biadi, O., L. Potena, W. F. Fearon, H. I. Luikar, A. Yeung, R. Ferrara, S. A. Hunt, E. S. Mocarski and H. A. Valantine. (2007) Interplay between systemic inflammation and markers of insulin resistance in cardiovascular prognosis after heart transplantation. J Heart Lung Transplant. 26:324-330.

118. Kawasaki, H., E.S. Mocarski, I. Kosugi, T. Tsuchida, and Y. Tsutsui. (2007) Cyclosporin A inhibits mouse cytomegalovirus infection via a cyclophilin-dependent pathway specifically in neural stem/progenitor cells. J. Virol. 81:9013-9023.

119. Potena, L., W. F. Fearon, K. Sydow C. T. J. Holweg, H. Luikart, C. Chin, D. Weisshar, E. S. Mocarski, D. B. Lewis, H. A. Valantine and J. P. Cooke. (2008) Asymmetric dimethylarginine and cardiac allograft vasculopathy progression: modulation by sirolimus. Transplantation 85:825-833

120. McCormick, A. L., L. Roback and E. S. Mocarski. (2008) vMIA control of intramitochondrial, HtrA2/Omi-dependent cytomegalovirus programmed cell death to terminate the replication cycle. PLoS Pathogens 4: e1000063

121. Upton J. W., W. J. Kaiser, and E. S. Mocarski (2008) Cytomegalovirus m45 cell death suppression requires RHIM-dependent interaction with receptor-interacting protein 1 (RIP1). J. Biol. Chem. 283:16966-16970.

122. Vana, M. L., D. Formankova, S. Cha, A. Sharma, L. Potena, J. M. Y. Brown, and E. S. Mocarski. (2008) Comparison of qualitative PCR on polymorphonuclear leukocytes and AMPLICOR PCR on plasma permits identification of patients better able to control CMV following hematopoietic cell transplantation. Clinical Infect Dis. 47:535-539.

123. Tandon R., and E. S. Mocarski (2008) Cytomegalovirus tegument protein pp150 control of cytoplasmic maturation events. J. Virol. 82:9433-9444.

124. Stern, J. L., J. Cao, J. Xu, E. S. Mocarski and B. Slobedman. (2008) Repression of human cytomegalovirus major immediate early gene expression by the cellular transcription factor CCAAT displacement protein. Virology 378:214-225.

125. Kaiser, W. J., J. W. Upton, and E. S. Mocarski (2008) Receptor-Interacting Protein Homotypic Interaction Motif (RHIM)-dependent Control of NF-kB Activation via the DNA-dependent Activator of Interferon Regulatory Factors (DAI/ZBP1/DLM-1). J. Immunol. 181:6427-6434.

126. Holweg, C.T.J., L. Potena, H. Luikart, T. Yu, G.J. Berry, J.P. Cooke, H.A. Valantine, and E.S. Mocarski. (2009) Identification and classification of acute cardiac rejection by intragraft transcriptional profiling. Transplantation (submitted for publication).

127. Jacobson, M. A., Dittmer, D. P. Sinclair, E., Martin, J. N., Deeks, S. G., Hunt, P., Mocarski, E. S., and Shiboski, C. (2009) Is human herpesvirus replication associated with persistent abnormal CD8+ T cell activation and low CD4+ T cell counts in antiretroviral-suppressed HIV-infected patients? (submitted for publication) PLoS One (submitted for publication).

128. Tandon R., D. P. AuCoin and E. S. Mocarski (2009) Human cytomegalovirus exploits ESCRT machinery in the process of virion maturation. Traffic (submitted for publication).

Lee, A.W., T. M. C. Hornell, J. J. Harding, C. Deshpande, L. Hertel, V. Lacaille, A. Pashine, L. Mandic, E.S. Mocarski and E.D. Mellins. (2009) Human cytomegalovirus decreases constitutive transcription of MHC class II genes in mature Langerhans cells by downregulating CIITA transcript levels. (In preparation)

Books Edited:

Human Herpesviruses: Biology, Therapy and Immunoprophylaxis. A.M. Arvin, E.S. Mocarski, P. Moore, R. Whitley, K. Yamanishi, G. Campadelli-Fiumi, B. Roizman. Cambridge Press, Cambridge. (2007)

Invited Manuscript Reviews and Commentaries:

Mocarski, E.S. (1988). A meeting review. Genes & Development 2:926-928.

Mocarski. E.S. (1997) Propagation of KSHV in cultured cells (editorial). N. Eng. J. Med. 336:214-215.

Mocarski, E.S. (2002) Virus self-improvement through inflammation: No pain, no gain. Proc. Natl. Acad. Sci. USA 99: 3362-3364.

Potena, L., C. Holweg, H.A. Valantine, and E.S. Mocarski (2004) Cytomegalovirus and heart transplant atherosclerosis: A likely guilt hidden by weak proofs. Transplantation 78:631.

Patents:

Ho, D.Y-W., R.M. Sapolsky, E.S. Mocarski (1992) Gene transfer using herpes virus vectors as a tool for neuroprotection. U.S. Patent No. 5,661,033.

Mocarski, E. S. and K. Kondo (1995). Latent transcripts and proteins of cytomegalovirus. U.S. Patent No. 5,783,383.

Invited Chapters:

Mocarski, E.S. (1988). Biology and Replication of Cytomegalovirus. Transfusion Medicine Reviews 2:229-234.

Mocarski, E.S., G. B. Abenes, L. C. Sambucetti, W. C. Manning and J. M. Cherrington (1990). Molecular genetic analysis of cytomegalovirus gene function in growth, persistence and latency. Curr. Topics Micro. Immunol. 154:47-74.

Mocarski, E.S. (1991). Evidence for posttranscriptional regulation of cytomegalovirus gene expression. In E. Wagner, (ed.) Herpesvirus Transcription and Its Regulation CRC Reviews in Biology. CRC Press, Boca Raton, pp 287-299.

Mocarski, E.S. (1991). Initial events involved in CMV-cell interactions. Transplantation Proceedings 23:43-47.

Mocarski, E.S. (1993). Cytomegalovirus biology and replication. In B. Roizman, R. J. Whitley, C. Lopez (eds.) The Human Herpesviruses. Raven Press, New York. pp 173-226.

Mocarski, E.S. (1994) Cytomegalovirus. In R. Webster, A. Granoff (eds.) Encyclopedia of Virology. Saunders Scientific Publications, London.

Mocarski, E.S. (1995) Cytomegaloviruses and their replication. In B. N. Fields, D. M. Knipe, P. M. Howley (eds.) Fields Virology. Lippincott-Raven Publishers, New York. pp. 2447-2492.

Mocarski, E.S. and G.W. Kemble (1997) Recombinant cytomegaloviruses for study of replication and pathogenesis. Intervirology 39:320-330.

Kemble, G.W., G.M. Duke and E.S. Mocarski (1999) Human cytomegalovirus infection of the SCID-hu (thy/liv) mouse. Handbook of Animal Models of Infection. Academic Press.

Mocarski, E.S. (1999) Cytomegalovirus. In R. Webster, A. Granoff (eds.) Encyclopedia of Virology. Saunders Scientific Publications, London. Volume 1, pages 344-351.

Mocarski, E.S., and C.T. Courcelle (2001) Cytomegaloviruses and their replication. In D. M. Knipe, P. M. Howley (Eds.) Fields Virology. Lippincott Williams & Wilkins, Philadelphia. pp 2629-2673.

Saederup, N., and E.S. Mocarski (2002) Fatal Attraction: Cytomegalovirus-encoded chemokine homologs. Curr. Top. Microbiol. Immunol. 269: 235-256.

Mocarski, E.S. (2002) Immunomodulation by cytomegalovirus: manipulative strategies beyond evasion. Trends Microbiol 10:332-339.

Mocarski, E.S. (2004) Immune escape and exploitation strategies of cytomegaloviruses: impact on and imitation of the major histocompatibility system. Cell. Microbiol. 6:707-717.

Mocarski, E.S., G. Hahn, K.L. White, J. Xu, B. Slobedman, L. Hertel, S.A. Aguirre, S. Noda. (2006) Myeloid cell recruitment and function in pathogenesis and latency. In M. J. Reddehase (Ed.) Cytomegaloviruses: Molecular Biology and Immunology. Caister Academic Press, Hethersett, Norfolk, UK. pp 465-482.

Mocarski, E.S., T. Shenk, and R. F. Pass (2006) Cytomegaloviruses. In D. M. Knipe, P. M. Howley, D. E. Griffin, R. A. Lamb, M. A. Martin (Eds.) Fields Virology, 5th Edition. Lippincott Williams & Wilkins, Philadelphia. Chapter 69, pp 2707-2772.

O'Brien, S., M. Keating, and E. Mocarski. (2006) Updated guidelines on management of cytomegalovirus reactivation in patients with chronic lymphocytic leukemia treated with alemtuzumab. Clinical Lymphoma & Myeloma 7:125-130.

Mocarski, E.S. (2007) Comparative analysis of herpesvirus-common proteins. In A.M. Arvin, E.S. Mocarski, P. Moore, R. Whitley, K. Yamanishi, G. Campadelli-Fiume, B. Roizman. Human Herpesviruses: Biology, Therapy and Immunoprophylaxis. Cambridge Press, Cambridge, UK. pp 44-59.

Mocarski, E.S., and A.L. McCormick (2007) Betherpesvirus modulation of the host response to infection In A.M. Arvin, E.S. Mocarski, P. Moore, R. Whitley, K. Yamanishi, G. Campadelli-Fiume, B. Roizman. Human Herpesviruses: Biology, Therapy and Immunoprophylaxis. Cambridge Press, Cambridge, UK. pp 324-335.

Mocarski, E.S. (2007) Betaherpesvirus genes and their functions. In A.M. Arvin, E.S. Mocarski, P. Moore, R. Whitley, K. Yamanishi, G. Campadelli-Fiume, B. Roizman. Human Herpesviruses: Biology, Therapy and Immunoprophylaxis. Cambridge Press, Cambridge, UK. pp 204-230.

Mocarski, E.S. and R. F. Pass (2007) Cytomegalovirus (Herpesviridae): General Features of Human Cytomegalovirus. In B. Mahy, M. van Regenmortel (Eds.) Encyclopedia of Virology, 3th Edition. Elsevier, Oxford pp 474-485.

Mocarski, E.S. and A. Grakoui (2007) Persistent and Latent Infection. In B. Mahy, M. van Regenmortel (Eds.) Encyclopedia of Virology, 3th Edition. Elsevier, Oxford pp 108-116.

Roy, C.R. and E.S. Mocarski (2007) Pathogen subversion of cell intrinsic innate immunity. Nat. Immunol. Nature Immunology 8:1179-1187

Zeiner, G.M., M.D. Cleary, A.E. Fouts, C.D. Meiering, E.S. Mocarski and J.C.Boothroyd (2007) RNA analysis by biosynthetic tagging using 4 thiouracil and uracil phosphoribosyltransferase. Methods Mol Biol 419:135-146.